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A RECENT LAVA FLOW IN NEW MEXICO.

BY RALPH S. TARR.

IN the southern central part of New Mexico, on the mail road from Carthage to Fort Stanton, and about fifty miles east of the Rio Grande, there is a flow of basalt having every evidence of being very recent. It has a north and south extension of more than thirty miles, and a width varying from one-fourth of a mile to four miles. The point of extrusion is a small cone standing at the northern end. The period of eruption was brief, and the material extravasated has barely succeeded in filling a narrow valley. Some time ago I crossed this region, and made a few observations, which, though by no means complete, are deemed worthy of presentation, with the hope that the notice may serve to call the attention of some one to the interesting phenomena, and thus lead to a more detailed study.

The lava flow is situated in a basin of interior drainage, almost completely enclosed by mountains. This basin, which varies in width from ten to thirty miles, and has a north and south extension of fully one hundred miles, is bounded by the Oscura and Jicarilla Mountains on the north, the White and Sacramento Mountains on the east, the Huego and El Paso Mountains on the south, and the Organs and San Andreas on the west. The exact area of interior drainage cannot be told at present, but it must exceed one thousand square miles. On the foothills of the mountains are quite distinct beaches, which with other evidence tend to prove that this basin is the site of one of the Quaternary lakes, of which there were others in this vicinity. The loose gravels of the basin quickly absorb all the moisture which falls upon the surface, and the mountain torrents rarely escape far into the plain before being entirely absorbed. A few never-failing mountain brooks enter from the White Mountains on the northeast side, and they also sink into the soil within a few miles of their outlets from the mountain gorges. At the lowest part of the basin are some shallow salt lakes and marshes of the "playa" type, surrounded by extensive deposits of gypsum. These desiccated lake remnants, together with the beaches and extensive lake-bed deposits, conclusively prove the former existence of a lake in this interior basin, and the freshness of the deposits points strongly to the conclusion that the lake is of recent date.

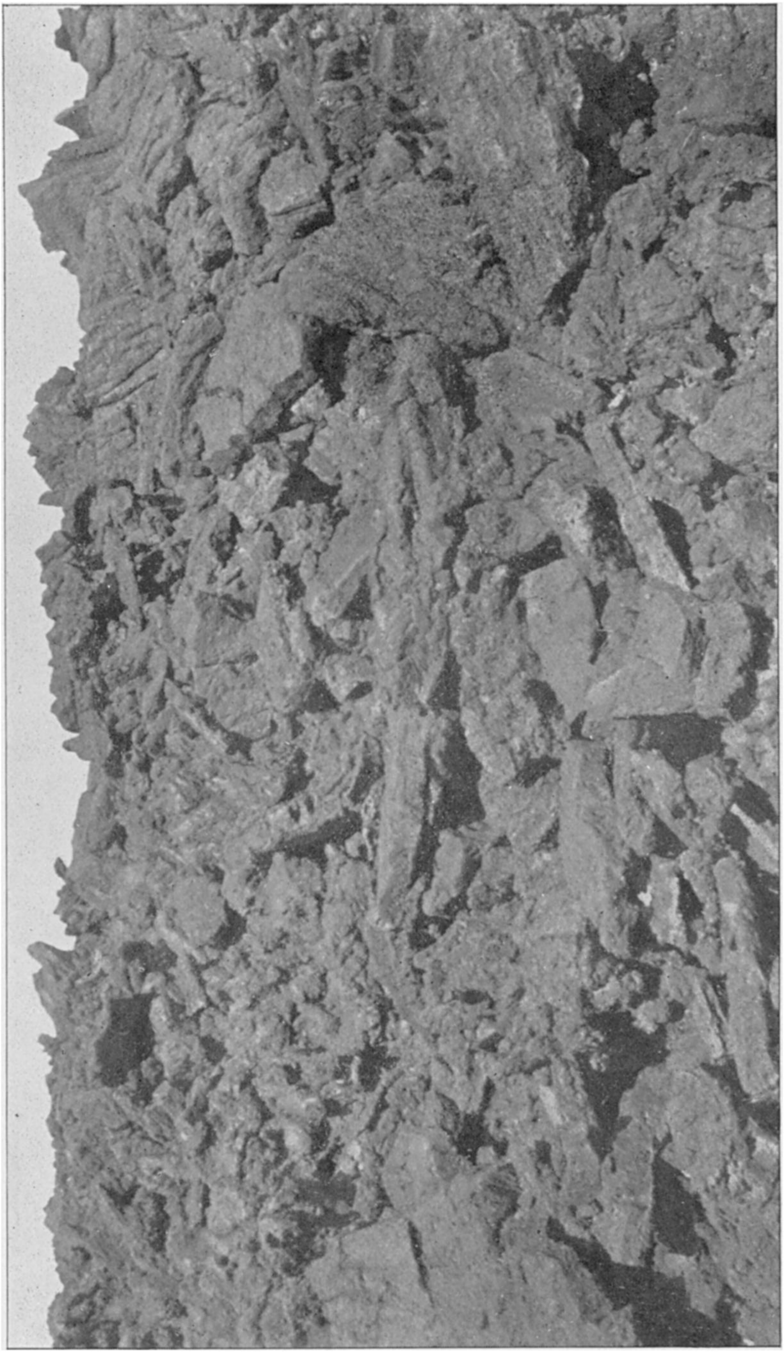
Both the mountains and foothills show signs of much more powerful erosion than seems possible under the present conditions of rainfall. This would not be so strongly stated if it were not for the fact that well-defined valleys, now somewhat clogged, extend well out into the lake deposits, much farther than the present streams succeed in going. It is in one of these valleys that the lava flow under consideration is found.

The cone which is at the northern end was not visited, but I was informed that it was fresh and had every appearance of extreme youth, and this must be so from the evidence furnished by the lava itself. Near the cone the lava spreads out over considerable territory, but farther south becomes constricted, and at the southern end again broadens out, conforming in a measure to the shape of the stream valley which it fills. The elevation at the northern end is 5,360 feet, while at the southern end it is 4,100 feet. Viewed from either side of the basin the flow is a striking object, forming as it does a jet-black stripe in the monotonous brown of the surrounding plain,—the brown so characteristic of the parched soil of an arid country. No bushes or grass have found life possible upon these black basaltic rocks, no soil has formed, and so the lava stands out with all its native blackness. Some moss, cacti, and a few stunted shrubs are the only forms of vegetable life that have as yet found a footing on this inhospitable rock, and these only in a few nooks and crevices.

The present surface is undoubtedly the surface of original cooling, and one might almost be justified in the belief that the cooling took place but yesterday were it not for the evidence to the contrary furnished by the scanty vegetation. The flow is made up of rolling masses of a vesicular, ropey lava, very much broken and fissured. Everywhere on the floor the basalt has been broken into splinters and boulders, which are piled up in little hillocks over almost every part of the surface. So ragged is this surface that in only one or two places is it possible for even a mule to find his way across the lava. The stage road is deflected by it for a distance of several miles, then crosses it at the narrowest part, running for the entire distance over bed-rock, which rings with a metallic ring under the hoofs of the horses and the wheels of the wagon. On either side of the road is an impassable desert of boulders, slaggy and black, and ranging in size from mere splinters to large blocks many tons in weight. Frequently it is possible to see where the consolidated crust of the flow burst asunder and a small side stream issued forth, cooling and cracking into slaggy, vesicular splinters and blocks. At other places the lava surface has broken into innumerable pieces, as if under the influence of some irregularity in the underlying topography. Not uncommonly the surface has been thrown into rounded waves, and cooled with the ropey surface so characteristic of some lava flows. The action of the weather has made no impression on the broken blocks. The sharp-pointed splinters and the ragged edges of the vesicles are as untouched by weather as if they had just ceased forming. The two photographs accompanying this paper, one a view of the side of the flow, the other a nearer view in the same locality, will vouch for what I have said, and will give a much better idea of the appearance than any description that I can write.

The region for many miles on either side of the lava flow is a desolate one, almost destitute of water and inhabited only by the ranchmen, who here and there have found a small spring at which they can water their cattle. Those who live in the vicinity are all of the opinion that the flow is a very recent one, and their conclusion is, as I think I have shown, well founded. They base their conclusion upon still another bit of evidence, which I cannot verify, since I have been unable to visit the locality. Without any personal evidence for or against it, I present the matter as it was told to me. The belief is that the lava has been erupted, if not since historic times, at least not long before the time of the Spanish Invasion. It is believed that the lava flow has been the means of destroying a large and thriving Pueblo Indian town. Many reliable persons have told me of certain ruins, fifteen or twenty

PLATE XII.



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miles north of the volcanic cone, which indicate the former existence there of not only a pueblo, but extensive irrigation works. These ruins are quite famous in New Mexico under name of the Gran Quivira. At present there is not even drinking water within many miles of the ruins, much less water for an irrigation supply. Furthermore, the canals are said to be at present tilted at various angles, as if disturbed by some subterranean disturbance. If this be true, we have not only a recent eruption, but also one which by either surface or subterranean disturbances has destroyed canals, and even caused a spring or stream to disappear. As I have said, whether this eruption has taken place since the time of the Pueblo Indian occupation of New Mexico or not I am not prepared to state; but certainly this isolated flow is in no way connected in point of time with the great basalt flows of the Tertiary in New Mexico, but is vastly more recent. The time of eruption must be reckoned, if not in hundreds, in thousands rather than tens of thousands of years. The matter deserves, I think, a much more careful study than I was able to give it, and I hope that some one may find it convenient to give it such a study.